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For better operating accounting in enterprises of the combine, purely operational losses are entered in a local Form No 2, as well as in Form No 11 ShP. Form No 2 refers not to all the resources in the exhausted areas, but merely to resources in the worked-out areas. (All further examination of operational losses is based on the percentage of loss which is entered on form No 2. The term "operational losses" is replaced by "losses.")

The following table shows the amounts of losses in the mines of the combine for the past 6 years.

Year	Losses (in percent)		Total
	Unmined Thickness	Unmined Area	
1943	11.9	5.3	17.2
1944	11.9	5.9	17.8
1945	11.8	6.4	18.2
1946	13.1	6.9	20.0
1947	13.2	6.8	20.0
1948	10.2	5.3	15.5

The graph in Figure 1 shows operational losses in trusts of the Moskvougol' Combine from 1943 to 1948.

In trusts working seams of average thickness (Molotovugol', Donskoyugol', Shcherbakovugol', and Oktyabr'ugol'), the losses were about the same. Greatest losses were in the mines of the Stalinogorskugol' and Krasnoarmeyskugol' trusts, which work thick seams. In the Stalinogorskugol' Trust, losses increased from 28.2 percent in 1943 to 32.9 percent in 1947. Losses in unmined thickness predominated, whereas coal losses from unmined area fluctuated between 3.4 and 6.7 percent.

Many mines working thick seams extracted only 50 to 60 percent of the coal, leaving the rest in the floor and roof of the seam. In 1947, for example, the loss in one of the mines of the Stalinogorskugol' Trust amounted to 39.1 percent, of another 34 percent.

In 1948, much more attention was given to the problem of coal losses than previously. As a result of measures taken in the mines of the Moskvougol' Combine, in 1948 mining operation methods improved considerably and losses in unmined coal were reduced, especially in the mines and trusts working thick seams (see Figure 2).

Coal losses in the combine decreased from 20 percent in 1947 to 16.9 percent in the first half of 1948, and to 14.1 percent in the second half of 1948. This decrease was effected mainly by reducing losses from unmined thickness, which were lowered from 13.2 percent in 1947 to 11.4 percent in the first half of 1948 and to 8.9 percent in the second half of 1948. Losses from unmined area were reduced only in the first quarter of 1948 (5.7 percent instead of 6.8 percent in 1947), and during the rest of the year remained at about the same level.

Operational losses in the trusts of Moskvougol' Combine in 1948 are shown in the graph in Figure 2. According to this graph, the greatest reduction in coal losses took place in the mines of the Stalinogorskugol' Trust (from 30.7 to 19.8 percent) and in the mines of the Krasnoarmeyskugol' Trust (from 24 to 19 percent), which work thick seams.

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Losses in the Stalinogorskugol' Trust declined regularly, as follows:

<u>Month</u>	<u>Loss (in percent)</u>	<u>Month</u>	<u>Loss (in percent)</u>
January	30.7	July	21.9
February	29.9	August	21.7
March	24.3	September	21.3
April	24.3	October	19.1
May	22.9	November	20.0
June	22.1	December	19.8

Reduction of losses was less significant in mines of the other trusts, which are working seams of average thickness.

In 1948, losses decreased mainly as a result of the partial execution of the following measures:

1. In mines working thick seams, less coal was left in the roof and floor.
2. Losses in unmined area were reduced in the between-face pillars, which up to 1948 were removed to only a small degree.

The significant decrease in coal losses in 1948 indicates a considerable improvement in mining activities of the mines of the combine. However, there are still many mines (especially those working thick layers) where losses, up to this time, are considerably higher than the established norms. In spite of the inconsistency in the thickness of the coal seams and the varied structure of surrounding rock layers, these high losses in the mines of the combine's six trusts are explained by the fact that the mines practice only two mining systems. The basic system consists of mining by long columns (stolb), with the longwall system used in single layers. An auxiliary system, which is used only when the first system is not practicable, consists of mining out the tailings and pillars, etc.

Of course, the varied seam thickness and structure observed in the combine's mines make it impossible to select for all the mines a single mining system which will simultaneously satisfy three basic requirements: maximum working safety, minimum production cost, and minimum coal loss.

The practice of using only one system of mining which is efficient for seams of average thickness has proved unsuitable in thick seams and leads to intolerably high coal losses in the roof and floor of the seam, and to a waste of the deposit.

In 1948, a special decree of the Collegium of the former Ministry of Coal Industry of the Western Regions was devoted to the problem of lowering coal losses and introducing new mining systems in the mines of the Moscow Coal Basin. This decree offered concrete measures, which, if carried out, would solve the problem of losses in unmined thickness.

Technical engineers and scientific workers of Moscow Oblast have offered several plans for a new system of mining thick seams. These plans provide for mining the seams in layers.

The Collegium ordered the management of the Moskvougol' Combine, before 1 October 1948, to conduct industrial experiments on the new methods of working thick seams, to work out and approve the conversion of mines to the working of thicker seams by the approved systems, to prohibit mining of seams more than 3.5 meters thick by the one-layer system, and to increase the working depth of the faces to 2.8-3.0 meters in seams less than 3.5 meters thick.

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The decision of the Collegium to increase the working thickness of the faces to 2.8-3.0 meters, in cases where single-level cutting was done in mines working seams up to 3.5 meters thick, was carried out to a great extent.

The leading miners of the combine did not limit themselves to mining the working faces to the established thickness, but continue to increase the thickness. Miners of Mine No 22 of the Stalinogorskugol' Trust showed the most progress in this task. Until recently, in view of the instability of rock layers in the Moscow Coal basin, 3 meters was considered the maximum working thickness. The miners in Mine No 22 showed that it was possible to mine the seams to a thickness of 3.5 meters. This was a significant achievement which broke old norms and made it possible to increase coal production and to prolong the life of the mine.

For many years, Mine No 22 (and other mines which worked thick seams) worked seams, as a rule, to not more than 2.7 meters and averaged only 2.3 to 2.5 meters. Much coal was left in the roof and floor of the seam.

In the second half of 1948, coal losses dropped sharply and seams were worked to a thickness of 3.0 to 3.5 meters.

This success was assured first by good reinforcing, well-timed and complete collapsing of the worked-out sections, satisfactory labor concentration, and preliminary drainage of flooded sections, i.e., by the fulfillment of the requirements for mining seams of any thickness, with the difference that these requirements had to be carried out more carefully and accurately in working the thicker seams.

At first, difficulties were encountered in supporting the worked-out sections, but this problem was quickly solved.

As can be expected, increasing the working depth of the seams increased production indexes in the mine. Labor productivity in section No 4, for example, increased 9 percent in the second half of 1948 (in comparison with the first half of the year), and in section No 1 it increased 28 percent. In the last months labor productivity increased even more, 15 and 48 percent, respectively. Consumption of timber supports in the sections decreased 5-20 percent.

Whereas average coal production per linear meter of preliminary cutting varied from 70 to 90 tons in the sections, after the working thickness of the seams was increased, this production was increased to 110 to 125 tons. At present, a single cutting from a face 60 meters long produced 500 tons of coal.

It would also be possible to quote examples of other mines where the working thickness was increased to 3 meters or more.

Some mine directors, in increasing the working thickness in the seams, do not pay enough attention to mine safety. In many cases the roof of the seam is insufficiently supported while the seams are being worked to increased thicknesses.

Although the Collegium's decision to increase the working depth in the seams met with much success in the combine's mines, experiments and introduction of new mining systems for thick seams met with entirely different results.

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Experiments with the new layer systems of mining progressed too slowly and on too small a scale. Mine No 32 of the Krasnoarmeyskugol' Trust is experimenting with the layer system of mining, according to the plan of Professor Sonin. Mine No 26 of the Stalinogorskugol' Trust is conducting experiments in the layer system of mining according to Engineer Babokin's plan, and at several faces, according to the plan of "Mosbasshakhtoprojekt."

The organization of experimental work in Mine No 32 was unsatisfactory from the very beginning. Many crude technical mistakes were permitted since there was no special technical supervision. Although the final results of mining coal from both layers are not yet available, it can already be predicted that coal losses will be large, especially in the lower layer, because of these mistakes.

The incorrect conducting of tests of the new mining system inevitably caused mistakes. There are already individual technical workers in the mines and trusts who have a preconceived opinion of the system. They discredit the layer system of mining according to Professor Sonin's plan although there is, as yet, no basis for considering it inefficient or unsuitable.

In Mine No 26, where two layer systems are being tested, cleaning removal is being done only on the upper level. Here, as in Mine No 32, the organizational side of the experiment is unsatisfactory. Experimental work is carried on without special technical supervision, and as a result serious technical mistakes are permitted.

One of the basic mistakes made in this experiment is that too thin a lower layer of coal is left in testing the "Mosbasshakhtoprojekt" system. When the seam is an average of 4 meters thick, 2.2 to 2.3 meters are often mined in the upper layer instead of the 2 meters planned. Besides that, 20 centimeters or more of coal are left on the roof as a protective layer. There is no good reason for leaving this layer of coal, since, in a majority of cases, compact clay and clayey shale, i.e., adequately firm rocks, form the immediate roof. In this way, only 1.4 to 2.0 meters, or an average of 1.7 to 1.8 meters, are left in the lower layer.

Such a division of the 4-meter seam (2.2 to 2.5 meters in the upper layer and 1.4 to 2.0 meters in the lower) artificially creates unequal conditions for working these two layers. Mining in the upper layer is accomplished with the advantage of a stable, undisturbed roof which is further protected by a protective layer of coal. In working the lower layer, however, work is done with disturbed and consequently less stable rocks, in a layer with only a 1.7-meter average thickness. A protective layer of coal left in the roof would be more necessary in this case.

In conclusion, it can be said that the 4.5-percent decrease in coal losses in 1948 (compared with 1947) in the mines of the Moskvougol' Combine is due to the successes of Moscow miners. Hundreds of thousands of tons of coal which formerly had been left in the mines as loss were recovered in 1948. This was accomplished without additional expense.

However, in spite of successes in decreasing coal losses in 1948 (in comparison with previous years), many mines, mainly those working thick seams, continue to leave intolerably large amounts of coal as loss.

Conclusions

In order further to improve mining methods in mines of the Moskvougol' Combine and to decrease coal losses to the established norms, the following measures are necessary:

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1. Testing and introduction of new layer systems of mining for working thick seams must be considered the paramount task.

2. In mines working thick seams (up to 3.5 meters), increasing the working thickness of the faces to the established norm is the most efficient method of decreasing coal losses.

3. In connection with increasing the working thickness of the faces, it is necessary for the technical departments of the trusts and combine to re-examine the condition of the timbers at the faces and to work out special protection for the workers from pieces of rock falling from the roof. This protection can be heavy spanning timbers, suspended metal screens, or some other form of safety device, but this problem must be solved as soon as possible.

4. As the inspection has shown, the majority of mines in the combine are still capable of reducing their coal losses both in area and in thickness.

[Appended figures follow.]

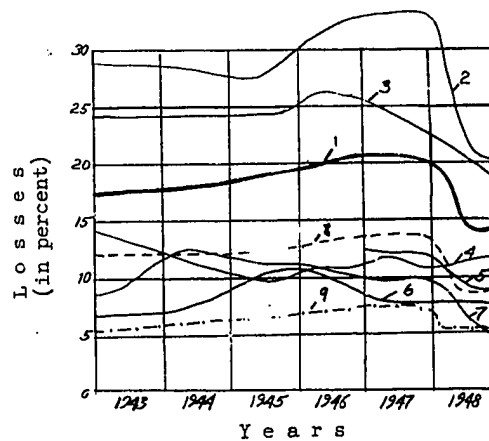


Figure 1. Operational Losses in Moskvougol' Combine Trusts, 1943 - 1948

1. Total losses in the Moskvougol' Combine; 2. Stalinogorskugol' Trust; 3. Krasnoarmeyskugol' Trust; 4. Donskoyugol' Trust; 5. Shcherbakovugol' Trust; 6. Molotovugol' Trust; 7. Oktyabr'ugol' Trust; 8. Losses in unmined thickness in the Moskvougol' Combine; 9. Losses in unmined area in the Moskvougol' Combine.

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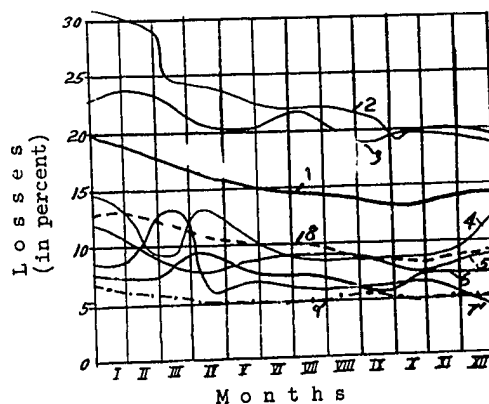


Figure 2. Operational Losses in Moskvougol' Combine Trusts, 1948

1. Total losses in the Moskvougol' Combine; 2. Stalinogorskugol' Trust; 3. Krasnoarmeyskugol' Trust; 4. Donskoyugol' Trust; 5. Shcherbakovugol' Trust; 6. Molotovugol' Trust; 7. Oktyabr'ugol' Trust; 8. Losses in unmined thickness in the Moskvougol' Combine; 9. Losses in unmined area in the Moskvougol' Combine.

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